

In the Claims:

Claim 1 was examined.

Claim 1 has been amended.

New claims 2-14 have been added.

1. (currently amended) A loudspeaker comprising:

a frame having an interior bottom surface with a side portion extending upward from, and surrounding, said interior bottom surface, said side portion terminating in an exterior edge of a uniform first height above said interior bottom surface with said exterior edge defining an opening into the frame having a first predetermined size and shape, ~~and a selected distance between said interior bottom surface and said exterior edge an inner surface of said side portion defines an interior mounting surface therearound;~~

a cone having an outer edge and an inner edge, ~~said cone having~~ and a top surface and a bottom surface with said outer edge being substantially the same shape as, and a second size that is smaller than said first size defined by the exterior edge of the frame, with said inner edge defined by a centrally located circular hole of a first diameter through the cone, said first diameter having a third size that is smaller than said second size;

~~a dual-suspension system having first and second flexible suspension portions separated a predetermined distance from each other with the first suspension portion connected between the exterior edge of the frame and the outer edge of the cone, and the second suspension portion connected between said interior mounting surface of the frame and the bottom of the cone spaced apart from the outer edge of the cone;~~

an audio motor including a magnet assembly, ~~a thin-walled bobbin and a voice coil wound near a bottom edge of the bobbin with the magnet assembly~~ having an air gap mounted to the bottom surface of the frame with a top of the magnet assembly below said interior mounting surface on the side

of the frame; and the a thin walled bobbin has having an outer surface of a second diameter with a first end with a voice coil wound thereon and located in said air gap, and a second end with the inner edge of said cone attached to the an outer surface of the bobbin spaced apart from said voice coil at or near said second end, said first diameter and said second diameter being substantially equal one to the other; and

a stiff flat diaphragm having an outer edge, a top surface and a bottom surface; said stiff flat diaphragm having a third size that is substantially the same or smaller than said second size and is substantially the same shape as said opening defined by the exterior edge of the frame; the outer edge of the diaphragm connected to the top surface of the cone at or near said outer edge of said cone; and the bottom surface of said stiff flat diaphragm having a centrally located connecting ring of a third diameter that is larger than second diameter of the bobbin with said connecting ring of the diaphragm connected perpendicular connection to a top edge said second end of the bobbin;

wherein said top surface of said cone, a portion of said bottom surface of said stiff flat diaphragm and said perpendicular connection define an enclosed triangular area that encircles a center portion of said loudspeaker.

2. (new) A loudspeaker as in claim 1:

wherein said frame defines in said side portion an interior mounting surface therearound between said exterior edge and a top of said audio motor spaced apart from each; and

further comprising a second flexible suspension having an outer edge and an inner edge with the outer edge affixed to said interior mounting surface therearound and said inner edge defining a center hole therein having a third diameter that is substantially equal to said first and second diameters with said inner edge attached to the outer surface of said bobbin at substantially the same location at which said inner edge of said cone is attached to said bobbin.

3. (new) A loudspeaker as in claim 2 further comprising:

a ring shaped joining collar with an inner diameter that is substantially the same as the outer diameter of the bobbin having a top edge and an outward flaring lower edge, said joining collar affixed to said outer surface of said bobbin with said top edge of said joining collar substantially even with said second end of the bobbin and said outward flaring lower edge substantially at or near said second end of said bobbin;

wherein said inner edges of said cone and said second flexible suspension being both affixed to said outward flaring lower edge of said joining collar for attachment to said outer surface of said bobbin.

4. (new) A loudspeaker as in claim 1 wherein said perpendicular connection includes an extension ring having a top edge and a bottom edge with said bottom edge mating with, and attached to, said second end of said bobbin and said top edge perpendicularly affixed to said bottom surface of said diaphragm above said second edge of said bobbin.

5. (new) A loudspeaker as in claim 4 wherein said bottom edge of said extension ring is bifurcated having two tines with a space between the tines being wide enough to receive said second edge of said bobbin between the tines and to be affixed thereto.

6. (new) A loudspeaker as in claim 4 wherein said diaphragm defines an outward extending, low height centered ring on the bottom surface sized to receive said top edge of said extension ring and be affixed thereto perpendicular to the bottom surface of the diaphragm.

7. (new) A loudspeaker as in claim 4 wherein said diaphragm defines a centered circular positioning bead on the bottom surface disposed to mate with said top edge of said extension ring perpendicularly to said bottom surface of said

diaphragm.

8. (new) A loudspeaker as in claim 7 wherein said top edge of said extension ring defines a three tined fork with two outer tines of the same length and the center tine slightly shorter than the two outer tines to mate with said positioning bead of said diaphragm with the two outer tines spaced apart from each other to receive said positioning bead therebetween and said center tine being shorter than the two outer tines by a height of said positioning bead to facilitate the two outer tines mating with the bottom surface of said diaphragm and said center tine with a top of said positioning bead.

9. (new) A loudspeaker as in claim 1 wherein each of said perpendicular connection and said cone define vent holes therethrough spaced therearound each of said perpendicular connection and cone to facilitate cooling of the loudspeaker.

10. (new) A loudspeaker comprising:  
a frame having an interior bottom surface with a side portion extending upward from, and surrounding, said interior bottom surface, said side portion terminating in an exterior edge of a uniform first height above said interior bottom surface with said exterior edge defining an opening into the frame having a first predetermined size and shape;

an audio motor including a magnet assembly having an air gap mounted to the bottom surface of the frame and a thin walled bobbin having an outer surface of a first diameter with a first end with a voice coil wound thereon and located in said air gap, and a second end extending out of said air gap;

a cone having an outer edge and an inner edge, and a top surface and a bottom surface with said outer edge being substantially the same shape as, and a second size that is smaller than said first size defined by the exterior edge of the frame, with said

inner edge defined by a centrally located circular hole of a second diameter through the cone, said second diameter having a third size that is smaller than said second size, said inner edge of the cone is affixed to said outer surface of said bobbin spaced apart from said second end; the cone from the inner edge radiates outward and upward at a first selected angle to a flat plateau, from said plateau downward into a deep groove with an outer side of said groove extending outward and upward to said outer edge; wherein outer most ends of said plateau define a circle of a third diameter that is larger than an outer most extent of said audio motor relative to said interior bottom surface of said frame with a bottom most point of said groove defining a circle of a fourth diameter that is larger than said third diameter;

a first flexible suspension connected between the exterior edge of the frame and the outer edge of the cone; and

a stiff diaphragm having an outer edge, a top surface and a bottom surface; said stiff diaphragm having a fifth diameter that is equal to, or somewhat greater than said third diameter, the bottom surface of an outer portion of said diaphragm is affixed to said plateau of the cone, and the bottom surface of a center portion of said diaphragm is affixed to said second end of the bobbin;

wherein an inner most portion of said cone, a portion of said bottom surface of said diaphragm and a portion of said outer surface of said bobbin nearest said second end define an enclosed substantially triangular area that encircles a center portion of said loudspeaker; and

wherein when audio motor is energized and said voice coil drawn inward the groove portion of said cone moves inward toward said bottom of said frame and clears the outer most extend of said audio motor.

11. (new) A loudspeaker as in claim 10:

wherein said frame defines an interior mounting surface therearound spaced apart from said exterior edge and adjacent a bottom portion of said deep groove when said audio motor is unenergized; and

further comprising a second flexible suspension having an outer edge and an inner edge with the outer edge affixed to said interior mounting surface therearound and said inner edge to said bottom portion of said deep groove.

12. (new) A loudspeaker as in claim 11 further comprising:

a ring shaped sleeve with an inner diameter that is substantially the same as the outer diameter of the bobbin having a lower edge and an outward flaring top edge, said sleeve affixed to said outer surface of said bobbin with said top edge spaced apart from said second end;

wherein said inner edge of said cone being affixed to said outward flaring top edge of said sleeve for attachment to said outer surface of said bobbin.

13. (new) A loudspeaker as in claim 10 wherein said diaphragm includes a centrally defined circularly shape connection shoulder having a sixth diameter that is substantially equal to said first diameter, said connection shoulder affixed to said second end of said bobbin.

14. (new) A loudspeaker as in claim 10 wherein vent holes are defined by, through, and spaced around each of said bobbin near said second edge and a portion of said cone nearest said bobbin to facilitate cooling of the loudspeaker.